WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a switching element provided on a surface of a semiconductor layer;

a substrate at another surface of the semiconductor layer;

a portion of the semiconductor layer located between the switching element and the substrate having an impurity concentration sufficient enough so that a region adjacent to the substrate is not depleted;

a defect region provided in a portion of said semiconductor layer includes an entire non depletion layer, wherein the non-depletion layer is not depleted after a switch-off operation;

a peak of lattice defect concentration within said non-depletion layer, wherein said lattice defect concentration in the non-depletion layer is sufficient to shorten lifetime of carriers and reduce turn-off time; and

a switching control having a current flowing in a thickness direction of the semiconductor layer when said switching element is turned on and off.

2. A semiconductor device according to claim 1 wherein said defect region does not include said switching element.

3. A semiconductor device according to claim 1 wherein the life times of carriers in said defect region are shorter than those in other portions.

4. A semiconductor device according to claim 1 comprising a bipolar transistor with an emitter, a base and a collector thereof laid out in the thickness direction of said semiconductor layer,

wherein said switching element is a field-effect transistor which is turned on for injecting carriers to said base of said bipolar transistor.

5. A semiconductor device according to claim 2 comprising a bipolar transistor with an emitter, a base and a collector thereof laid out in the thickness direction of said semiconductor layer wherein said switching element is a field-effect transistor which is turned on for injecting carriers to said base of said bipolar transistor.

6. A semiconductor device according to claim 4 wherein said defect region includes an entire portion in said base in close proximity to said emitter which is not depleted after a switch-off operation.

7. A semiconductor device according to claim 5 wherein said defect region includes an entire portion in said base in close proximity to said emitter which is not depleted after a switch-off operation.

8. A semiconductor device according to claim 4 wherein said bipolar transistor and said field-effect transistor constitute an insulated-gate bipolar transistor (IGBT).

9. A semiconductor device according to claim 5 wherein said bipolar transistor and said field-effect transistor constitute an insulated-gate bipolar transistor (IGBT).

10. A semiconductor device according to claim 6 wherein said bipolar transistor and said field-effect transistor constitute an insulated-gate bipolar transistor (IGBT).

11. A semiconductor device according to claim 7 wherein said bipolar transistor and said field-effect transistor constitute an insulated-gate bipolar transistor (IGBT).